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7 October 1963

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MEMORANDUM FOR: Chairman, Technical Development Committee

THROUGH : Executive Secretary, TDC

SUBJECT : Staff Study - Feasibility Demonstration of the  
Multiple Image Correlator (Mark I)

1. PROBLEM:

Investigation and experimentation of image enhancement through an optical, mechanical and electronic process of the Multiple Image Correlator has been advanced to a state where additional feasibility tests should be performed at NPIC. In order to accomplish this program however, it will be necessary to finance the packaging, shipment, installation, checkout and instructions for operation of this instrument. The instructions should include the mechanical, optical and electronic operational features as well as the conceptual aspects of the system.

2. DISCUSSION:

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25X1 A wide variety of parameters have been examined and basic procedures established for use of the Multiple Image Correlator by [ ] of [ ] With these established procedures, it will be possible for NPIC to obtain more knowledge concerning its rather unique photographic requirements beyond that already established from samples of selected photography furnished by [ ]. Task Order No. 5 of the present contract has culminated in the receipt of: (a) Final Report, (b) Operator's Manual, (c) Performance Specifications, and (d) Input Specifications. The Multiple Image Correlator was developed under Task Order No. 2 to determine its feasibility and fabrication was completed on 1 August 1962. This same equipment was utilized as Government furnished equipment (GFE) in an evaluation program under Task Order No. 5, completed 29 July 1963. Task Order No. 6 was carried on concurrently with Task Order No. 5 and resulted in the design of a MIC Mark II which was the proposed successor to the Mark I. Task Order No. 6 also had been completed as of 29 July 1963. With the proposed Mark II design and the breadboard instrument available, it has been decided that further multiple image evaluation should be conducted at NPIC to ascertain the possible applications and limitations of this instrument before proceeding with any new correlator developments.

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The current proposal now under discussion will provide for the following tasks: (a) preparation of equipment for demonstration, (b) packaging and shipping the equipment to NPIC, (c) setup and checkout of equipment, and (d) the demonstration of the correlation techniques. The proposal is divided into phases A and B. Phase A is applicable to optical correlation only,

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GROUP 1  
Excluded from automatic  
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Phase B covers the demonstration of both optical and electronic correlation capabilities. The breadboard instrument will be available for demonstration and continuation of studies nine (9) weeks from date of contract approval. Additional equipment which is required to make this instrument operational has been requisitioned as of 1 October 1963, and is listed in requisitions 5500-2584-64 through 5500-2586-64. Delivery of these items which include; oscilloscope, power supplies and a band-pass filter is anticipated before arrival of the Multiple Image Correlator, Mark I.

One important item not mentioned in this proposal but developed under Task Order No. 7 is the chip cutter. This piece of equipment is essential for the preparation of the film chips used in the correlator and should be delivered at the same time.

3. CONCLUSIONS:

Of the two phases listed (A and B), Phase B will be required in order that responsible NPIC personnel be well versed in both the optical and electronic capabilities of the Multiple Image Correlator, Mark I. Since Task Orders No.s 5 and 6 have been completed, it is essential that the Multiple Image Correlator, Mark I be available at NPIC for further evaluation and testing using the photography obtained from our present systems where possible.

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4. RECOMMENDATIONS:

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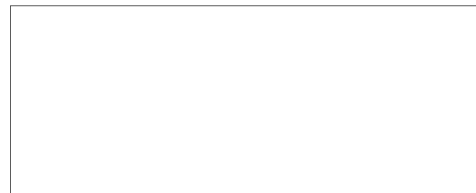
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a. That Phase B with Tasks 1, 2, 3 and 4 be approved and an SC-0, CPFF contract be awarded to [REDACTED] The cost of this contract should be less than [REDACTED] The cost submitted with the proposal was [REDACTED] but our computations resulted in a cost estimate of [REDACTED]

b. That the chip cutter (cookie cutter) be delivered with the correlator.

c. Size limitations of 44 inches deep, 78 inches high and 84 inches long, and a floor load limit of 350 pounds per square foot be adhered to in the packaging of the Multiple Image Correlator, Mark I.

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19 September 1963

U. S. Government  
2430 E Street, N. W.  
Washington 25, D. C.

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Attention:

Contracting Officer

Subject:

Multiple Image Correlator (Mark I) Feasibility  
Demonstration Proposal

Gentlemen:

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[redacted] submits herewith a proposal for a Multiple Image Correlator Feasibility Demonstration at the customer's facility. Enclosure 1 contains a technical description of the work to be performed. Enclosure 2 contains cost breakdowns for the various tasks involved, and Enclosure 3 defines the conditions upon which this proposal is based.

This program may be performed as follows:

- A. Tasks 1, 2, 3, and Task 4, Phase A - total estimated CPFF [redacted]
- B. Tasks 1, 2, 3, and Task 4, Phase B - total estimated CPFF [redacted]

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The total estimated CPFF, as specified above, is based on a total program duration of eleven (11) weeks.

Additional information relating to this bid may be obtained by contacting the undersigned.

Very truly yours,

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WRA/AER:mtp

Enclosure: 1, 2, and 3 As Stated Above

ENCLOSURE 1  
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## INTRODUCTION

This proposal outlines the technical support considered necessary to demonstrate the capabilities of the Multiple Image Correlator (Mark I) developed as feasibility equipment under [redacted], Task Order No. 2 (completed 1 August 1962). 25X1

This same feasibility equipment was utilized (as GFE) in an evaluation program under [redacted] Task Order No. 5, completed 29 July 1963. 25X1

It should be noted that the above feasibility equipment was utilized in a pre-design program for Multiple Image Correlator (Mark II) conducted as a parallel effort to Task Order No. 5 under Contract [redacted] Task Order No. 6, completed 29 July 1963. 25X1

The proposed support program consists of the following tasks:

1. Preparation of the equipment for demonstration and shipping.
2. Packaging and shipping the equipment to customer's destination.
3. Setup and checkout of the equipment at the customer's facility.
4. Demonstration of the correlation technique.

Tasks 1 and 2 will be performed [redacted] Tasks 3 and 4 will be performed at the customer's facility. Detail definition of tasks and schedules are provided in the body of the proposal. 25X1

## DESCRIPTION AND DEFINITION OF TASKS

GENERAL

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The Mark I Multiple Image Correlator has been at [ ] for a period of approximately two years. The Mark I was developed as a feasibility model under Contract [ ] Task Order No. 2, and was completed 1 August 1962. The Mark I was then supplied to [ ] as GFE to be used as the basis for an evaluation study and for use in a parallel effort for a predesign program for the Mark II version of the Multiple Image Correlator.

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These tasks were completed 29 July 1963 under Contract [ ] Task Order No's. 5 and 6. During the time of development and evaluation, the equipment was subjected to extensive use. Therefore, for optimum demonstration capabilities at the customer's facility, it is considered necessary that task 1 be performed at [ ] facility prior to shipment.

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Task 1

In view of the intensive use to which the Correlator was subjected during the performance of the evaluation task, possibly the equivalent of 2 to 3 years normal operational use, the optical system will be checked and cleaned. The mechanical controls (X Y  $\Theta$ ) of all eight stages will be cleaned and lubricated. The electronic circuitry will be checked. During the performance of the evaluation task, certain additional mechanical electronic features were breadboarded. These features were not a part of the original feasibility model, but will now require a degree of incorporation into the equipment for operational and safety reasons.

Task 2

Task 2 will consist of packaging and crating the Mark I Multiple Image Correlator and shipping the unit to the customer's facility. Probable mode of transportation will be padded van.

Task 3

Task 3 will consist of installation of the Mark I Multiple Image Correlator at the customer's facility. This task will also include an optical and electronic checkout prior to demonstration use. Due to the critical alignment necessary in the optical system, this checkout is considered to be necessary after any moving operation.

Task 4

Task 4 will consist of demonstrating the image correlation capabilities of the machine at the customer's facility, and will encompass two phases. Phase A encompasses only the optical and photographic procedures for image correlation, and Phase B will encompass the electronic and photographic operation of the machine.

Phase A. If only optical demonstrations of correlation is required, normal darkroom facilities with film and paper processing will be needed. This demonstration will require the services of an optical engineer versed in the technique.

Phase B. To demonstrate both electronic and optical capabilities will require the services of both an optical and an electronic engineer. These demonstrations can be done at the same time, but an electronic demonstration will require both services whereas an optical demonstration will require only optical services.

During the evaluation program conducted under [redacted] Task 25X1  
Order No. 5, the equipment as listed below is necessary for the electronic mode of operation.

5 Hewlett-Packard 721-A Power Supplies  
2 Textronic 545A Oscilloscopes  
1 Krohn-Hite Variable Band-Pass Filter

OR

Equivalents in each case.



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This equipment requires only hook-up to the Mark I with no modification to the machine. This listed equipment is standard electronic components and due to their use on other projects at [ ] will not be available for use at the customer's facility. It is felt that the above listed equipment can be easily leased in the area of the customer's facility, or procured from the customer's inventory. See Appendix A for approximate leasing costs.

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It is proposed that the [ ] personnel required for task 4 be made available at customer request on a demonstration-as-desired basis as their services cannot be spared for full time requirements covering any more than one to two weeks in duration.

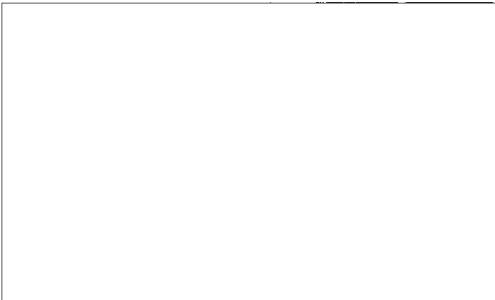
## TASK SCHEDULE

Task 1									
Task 2									
Task 3									
Task 4									
Weeks	1	2	3	4	5	6	7	8	9

## APPENDIX A

EQUIPMENT REQUIRED FOR ELECTRONIC MODE

The electronic equipment listed under task four (4) of the proposal which is necessary to operate in the electronic mode may be either taken from the customer's inventory or leased in the area of the customer's facility. A survey was conducted in this area and the following average costs were determined.

	Unit	Number Required	6 Month Lease	1 Year Lease
1)	Hewlett-Packard #721-A Power Supply	5		
2)	Textronic #545A Oscilloscope	2		
3)	Krohn-Hite Variable Band Pass Filter	1		

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ENCLOSURE 3

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## CONDITIONS OF BID

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Proposal P-431 is a CPFF Bid for performing a Multiple Image Correlator (Mark I) Feasibility Demonstration, and is based upon the following conditions:

- A. Performance in accordance with the Technical Proposal explicitly defined in Enclosure 1 hereto.
- B. Completion of performance within eleven (11) weeks after receipt of contractual authority to proceed.
- C. Performance of the Electronic Mode Demonstration (Phase B of Task 4) is based upon availability of Government Furnished Property defined in Appendix A to Enclosure 1 hereto.
- 25X1 D. The costs quoted herein do not include any Federal, State, local, or other taxes from which [ ] is exempt at the date of the attached proposal. If the Contractor must bear the burden of any taxes from which he was exempt at the date of this proposal, or any taxes enacted subsequent hereto but applied retroactively, the cost of this proposal shall be adjusted accordingly.
- 25X1 E. The man day rates quoted in Enclosure 2 are based on normal working days. Per diem will be reimbursed for every day the [ ] Representative/s are away from our [ ] Facilities, with the CPFF quoted herein adjusted accordingly.
- 25X1 F. Costs of general research and overhead will be allowable to the extent they are found to be reasonable.
- 25X1 G. Packaging will be in accordance with [ ] standard commercial practice for domestic shipments.
- 25X1 H. [ ] generally accepts terms and conditions required by the most recent revision of the Armed Services Procurement Regulations, Clause 7-203, for cost reimbursement supply type contracts.
- I. The f.o.b. point is destination, Washington, D.C.
- J. This proposal is firm for a period of thirty (30) days from date of submission.
- K. The total CPFF stated in the cover letter was computed as follows: Total CPFF for Tasks 1, 2, and 3, plus the initial man day rate depending on the phase, plus nine times the rate for additional days, again depending on the phase for Task 4.

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